Nate Smith (vilmibm)

Software Engineer @ Internet Archive

GOETICS: ON GO AS A TOOL FOR CREATIVE EXPRESSION

INTRODUCTION

hi, I'm ~vilmibm / nate

currently a software engineer

at the Internet Archive

IA is hiring!
https://archive.org/about/jobs

I work on https://scholar.archive.org , a full-text search over 41+ million open access scholarly PDFs, mix of Python+Go

INTRODUCTION

formerly a software engineer at GitHub

```
vilmibm at bronte in ~
↪ gh
Work seamlessly with GitHub from the command line.

USAGE
  gh <command> <subcommand> [flags]

CORE COMMANDS
  auth:          Authenticate gh and git with GitHub
  browse:        Open repositories, issues, pull requests, and more in the browser
  codespace:     Connect to and manage codespaces
  gist:          Manage gists
  issue:         Manage issues
  org:           Manage organizations
  pr:            Manage pull requests
  project:       Work with GitHub Projects.
  release:       Manage releases
  repo:          Manage repositories
```

if you've ever run **gh**, the github cli,
that means I've
been in your computer

INTRODUCTION

I also run tilde.town

```
vilmibm at bronte in ~
↪ ssh vilmibm@tilde.town
Linux tilde 6.12.38+deb13-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.12.38-1 (2025-07-16) x86_64
                                                  we're glad you're here!

Some commands to get you started:
+-----------------------------------------------------------------+
| nano          | edit a file                                     |
| town explore  | see recent changes around the town              |
| town bbj      | post in our local forum                         |
| town feels    | start a little command line blog                |
| town botany   | plant a little garden                           |
| town mail     | read and send e-mail to other users             |
| town wiki     | edit or view the community wiki                 |
| town writo    | draw on an infinite plane with others           |
| town graffiti | add to tilde.town/graffiti.html                 |
| town chat     | get real-time help with the town in a chatroom  |
| town aup      | read our code of conduct                        |
+-----------------------------------------------------------------+
```

```
→  ~ lastlog2 | wc -l
586
```

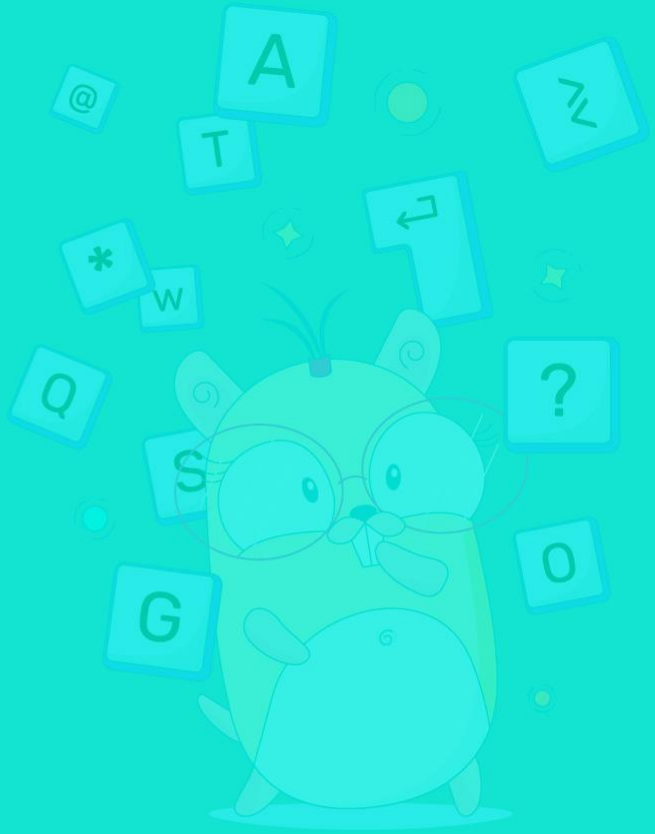
if you've ever been there that means you've been inside my computer

AGENDA

- **Introduction**
- **OK! But what even is art?**
  - philosophical notions
  - art + technology
- **The Broken Paintbrush**
  - history with creative programming
  - arrival at Go
- **Art+Go**
  - sundry recollections and observations
- **A Curious Lack**
  - a rallying cry

“QUALIFICATIONS”

- **primarily writing Go since 2019**



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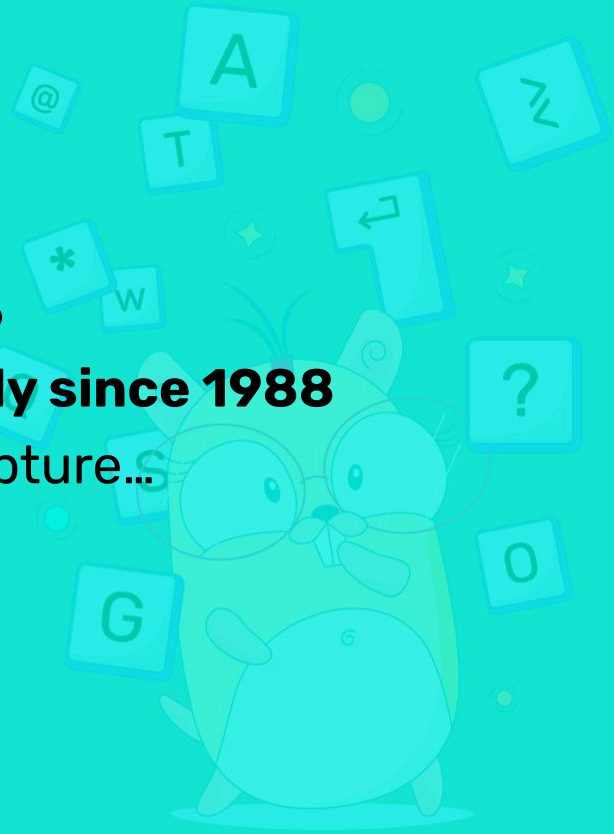
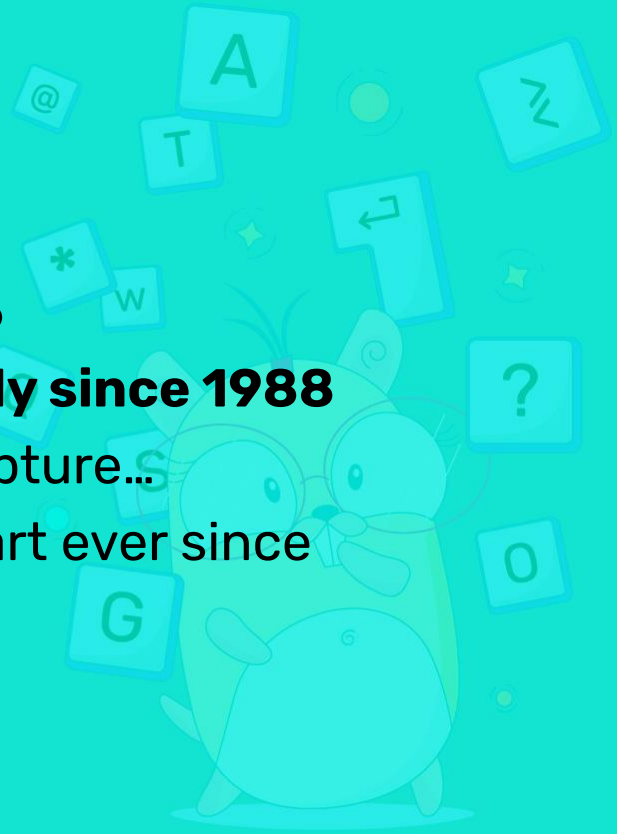


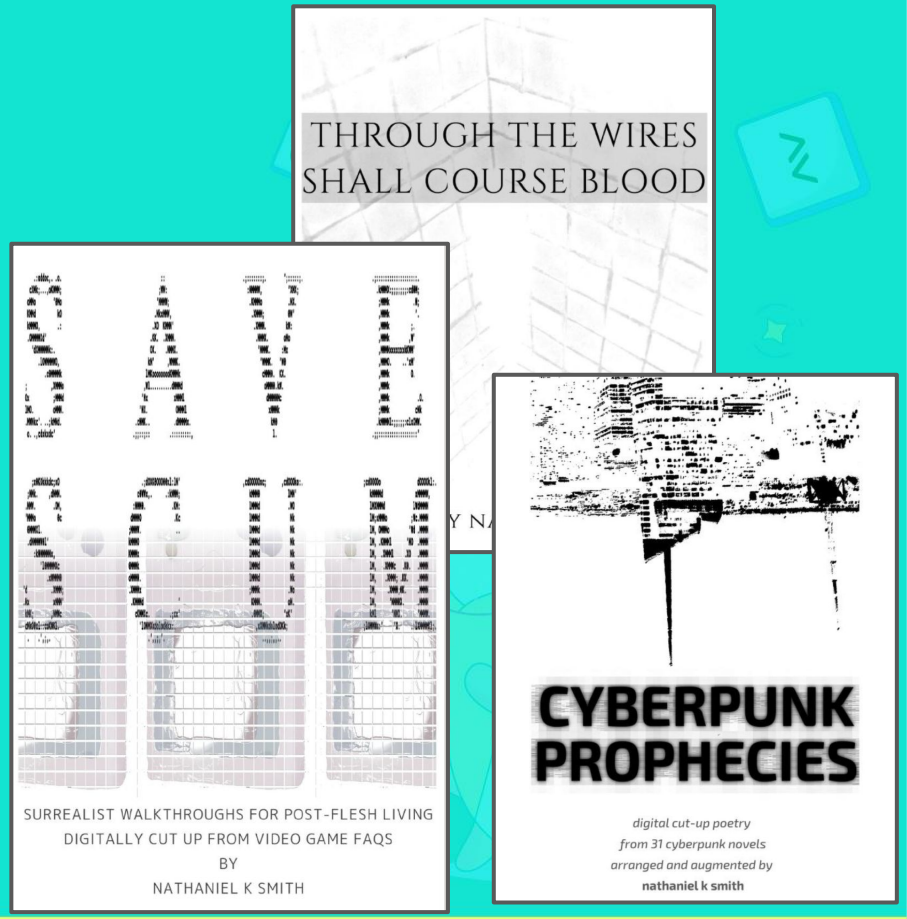
“QUALIFICATIONS”

- primarily writing Go since 2019
- trading code for money since 2006
- **born into a serially creative family since 1988**
  - painting, writing, comedy, sculpture…
  - beset by an inability to not do art ever since



WHAT I DO

- codewise
  - experimental/found poetry
  - terminal-based text mode art
  - weird web sites
- noncodewise (out of scope today)
  - noise music
  - collage
  - prose

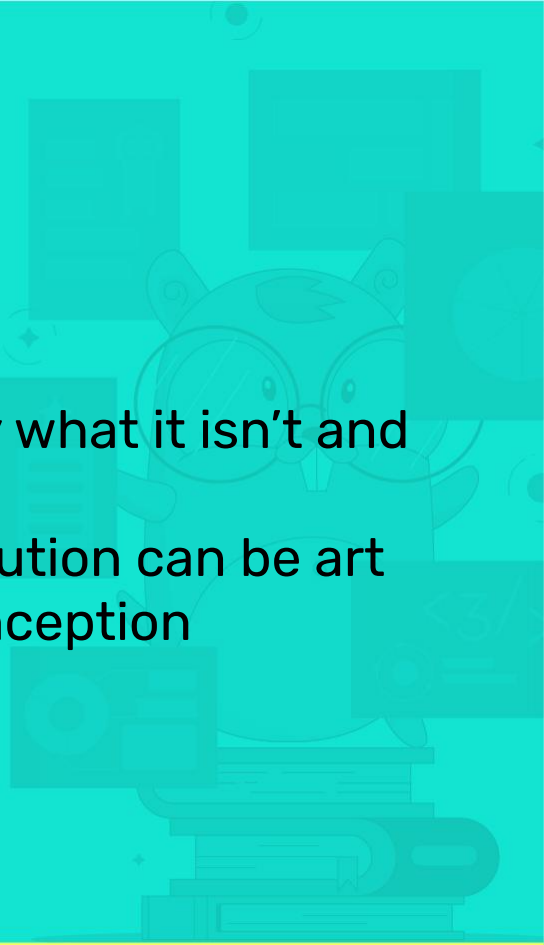


https://archive.org/details/@vilmibm

OK BUT WHAT EVEN IS ART

Or, more specifically, what even is creative technology?

- A thing defined by what it isn't and what it doesn't
- Code and its execution can be art
- A youthful misconception



A Thing Defined By What It Isn't And What It Doesn't

let's consult Theodor Adorno's *Aesthetic Theory (1970)*:

"(art) is defined by its relation to what it is not."

"The basic levels of experience that motivate art are related to those of the objective world from which they recoil."

"We don't understand music; it understands us"

A Thing Defined By What It Isn't And What It Doesn't

- **An object becomes an art object based on context**
  - human observation/reaction at a point in time that led to emotional impression

A Thing Defined By What It Isn't And What It Doesn't

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  - human observation/reaction at a point in time that led to emotional impression
- **It is allowed to be fully useless*, unlike a tool or piece of equipment**
  - is a hammer that cannot pound nails still a hammer?

L'œil, comme un ballon bizarre se dirige vers L'INFINI

** useless != purposeless*

A Thing Defined By What It Isn't And What It Doesn't

- An object becomes an art object based on context
  - human observation/reaction at a point in time that led to emotional impression
- It is allowed to be fully useless*, unlike a tool or piece of equipment
  - is a hammer that cannot pound nails still a hammer?
- **It could be a tool, too, but would still have value to a human observer if it is never once used**

L'œil, comme un ballon bizarre se dirige vers L'INFINI

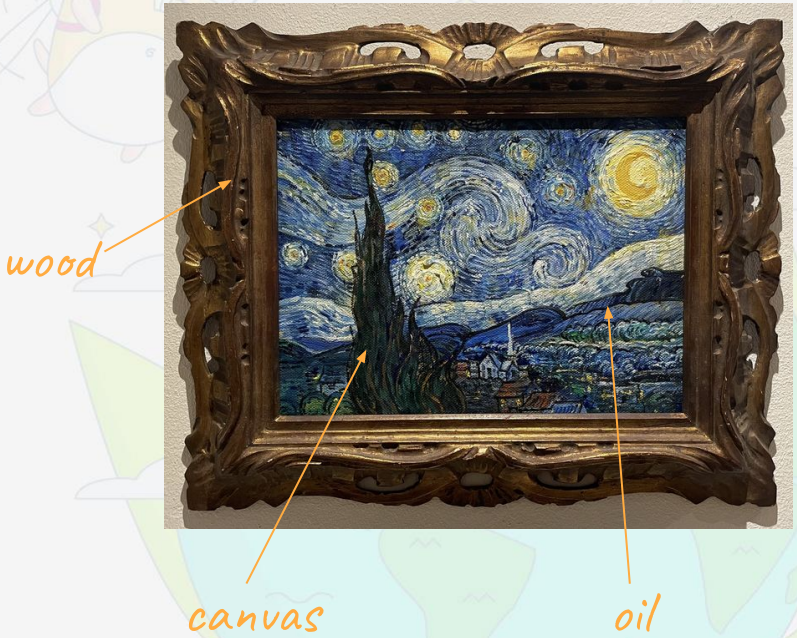
** useless != purposeless*

A Thing Defined By What It Isn't And What It Doesn't

- This is kindling

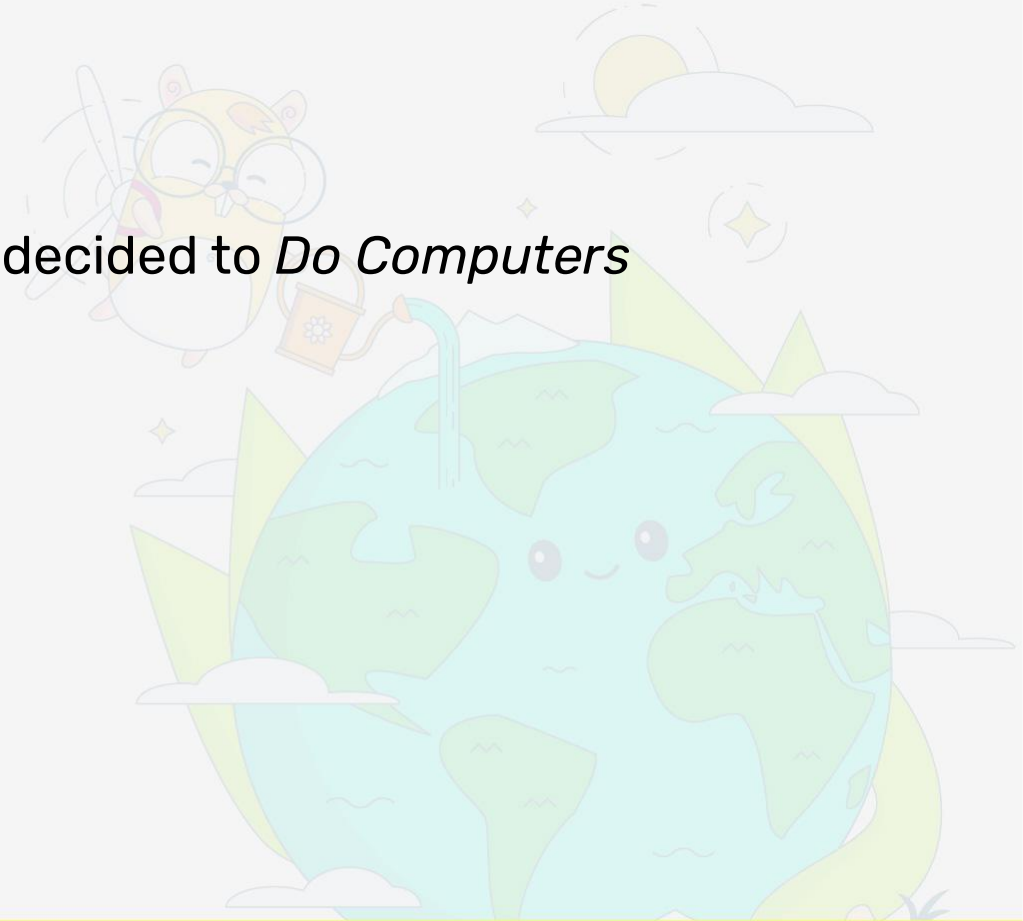
A Thing Defined By What It Isn't And What It Doesn't

- This is kindling
- but if we choose to leave it unburned it may delight us



A Youthful Misconception

- I got to college in 2006 and decided to *Do Computers*



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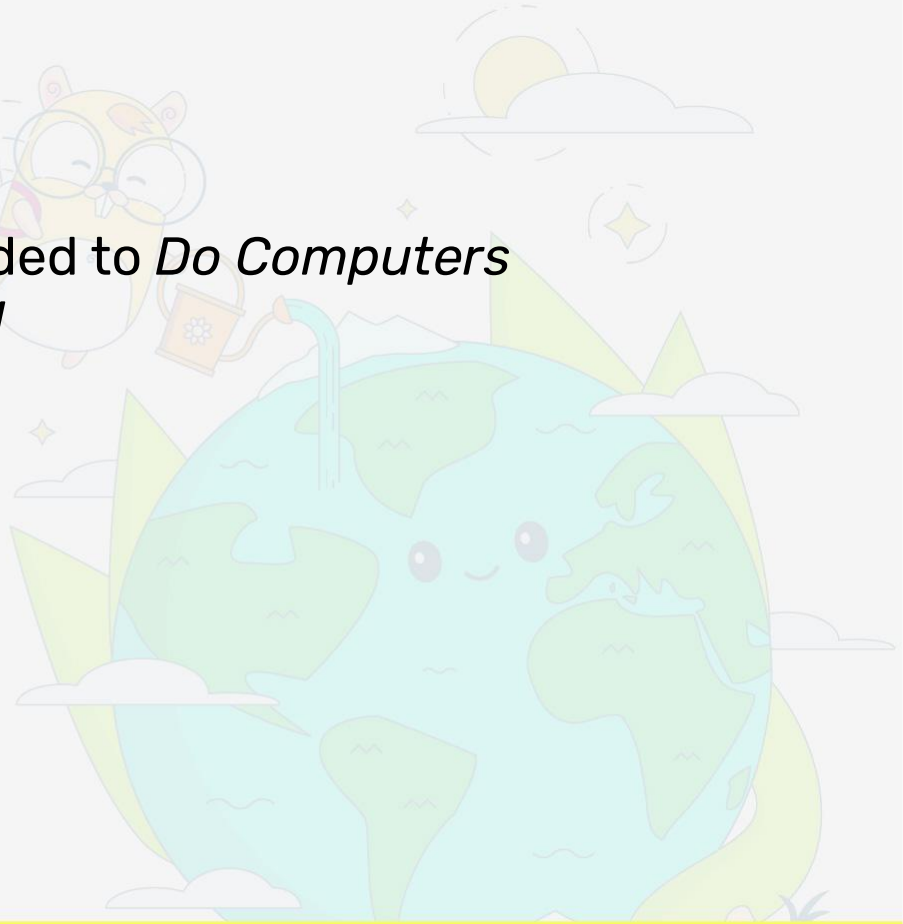
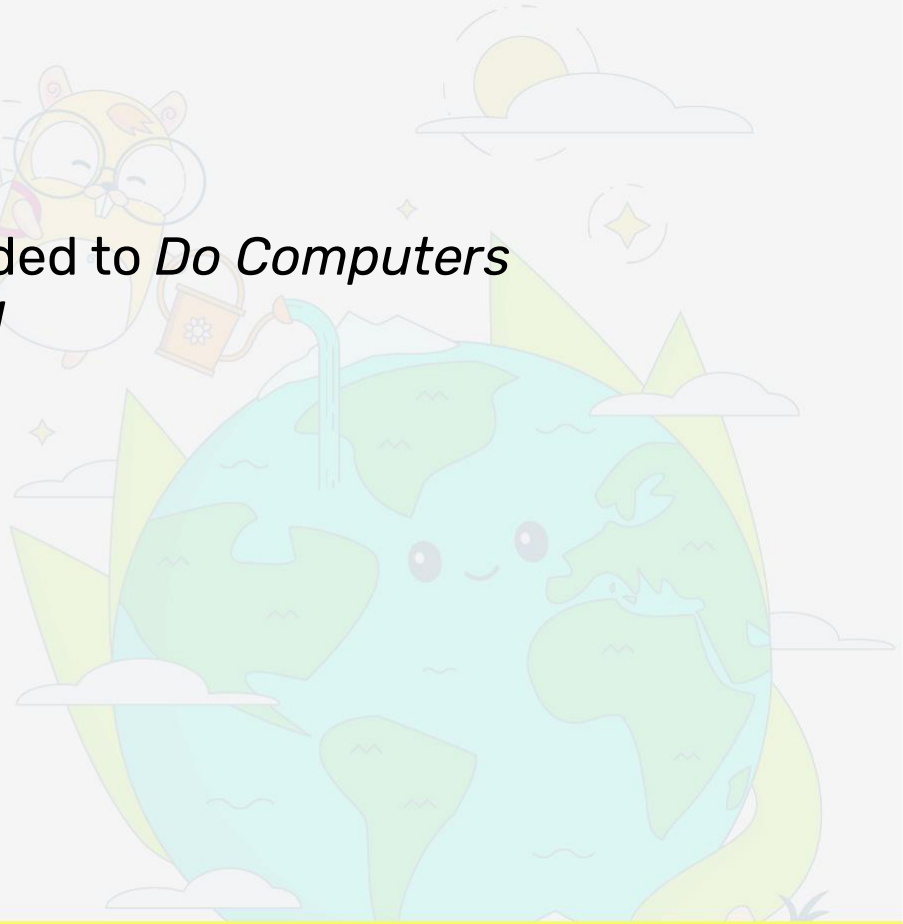
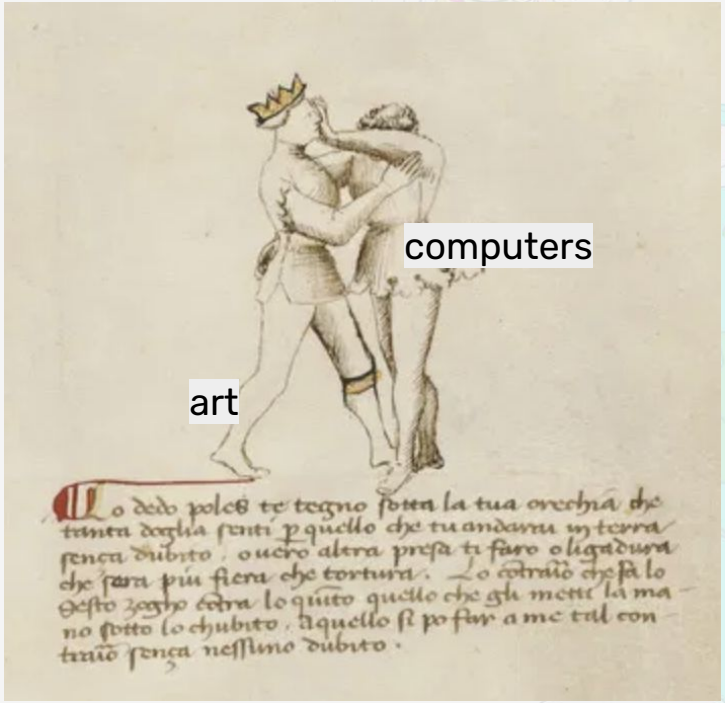


A Youthful Misconception

- I got to college in 2006 and decided to *Do Computers*
- but I was afraid of *Becoming IBM*
- so I resolved to *Do Art(?)*

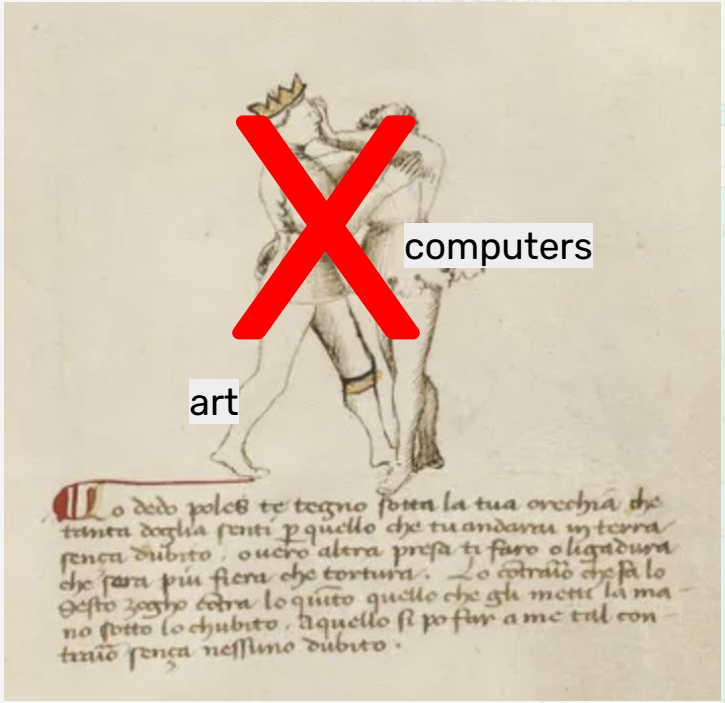


A Youthful Misconception

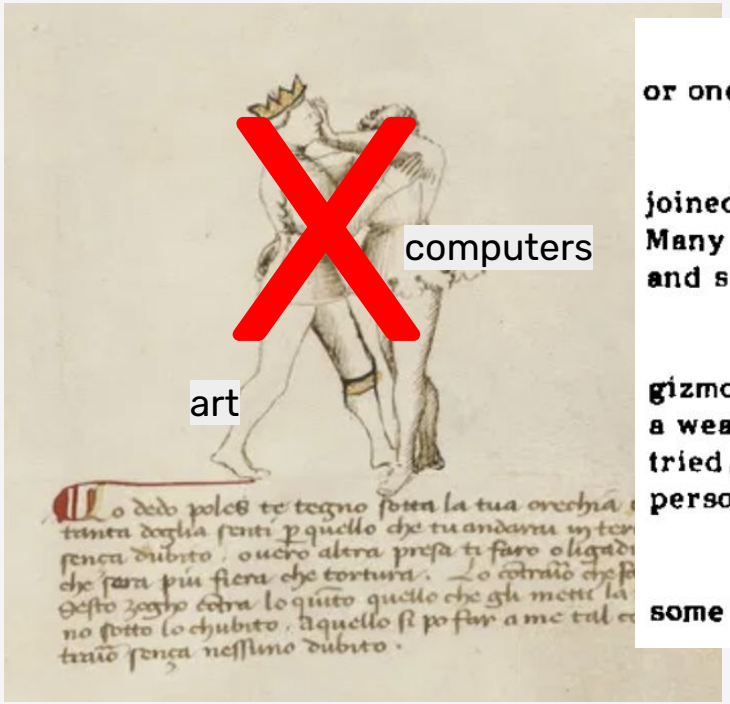


2006

A Youthful Misconception



A Youthful Misconception



Man has created the myth of "the computer" in his own image, or one of them: cold, immaculate, sterile, "scientific," oppressive.

Some people flee this image. Others, drawn toward it, have joined the cold-sterile-oppressive cult, and propagate it like a faith. Many are still about this mischief, making people do things rigidly and saying it is the computer's fault.

Still others see computers for what they really are: versatile gizmos which may be turned to any purpose, in any style. And so a wealth of new styles and human purposes are being proposed and tried, each proponent propounding his own dream in his own very personal way.

This book presents a panoply of things and dreams. Perhaps some will appeal to the reader...

from "Computer Lib" by Ted Nelson, 1975

Code and Its Execution Can Be Art

- This is donut.c
- It's C code in the shape of a donut

```
k;double sin()
,cos();main(){float A=
0,B=0,i,j,z[1760];char b[
1760];printf("\x1b[2J");for(;;
){memset(b,32,1760);memset(z,0,7040)
;for(j=0;6.28>j;j+=0.07)for(i=0;6.28
>i;i+=0.02){float c=sin(i),d=cos(j),e=
sin(A),f=sin(j),g=cos(A),h=d+2,D=1/(c*
h*e+f*g+5),l=cos      (i),m=cos(B),n=s\
in(B),t=c*h*g-f*        e;int x=40+30*D*
(l*h*m-t*n),y=            12+15*D*(l*h*n
+t*m),o=x+80*y,          N=8*((f*e-c*d*g
)*m-c*d*e-f*g-l        *d*n);if(22>y&&
y>0&&x>0&&80>x&&D>z[o]){z[o]=D;;;b[o]=
".,-~:;=!*#$@"[N>0?N:0];}}/*#****!!-*/
printf("\x1b[H");for(k=0;1761>k;k++)
putchar(k%80?b[k]:10);A+=0.04;B+=
0.02;}}/*********#########!!=;:~
~::==!!!**********!!!==::-
.,~~;;;========;;;:~-.
..,--------,*/
```

source: https://github.com/Fifirex/donut.c

Code and Its Execution Can Be Art

- The code has a purpose
- but that purpose is divorced from material needs
- We don't expect it to compute like we might tax software or a social network

source: https://github.com/Fifirex/donut.c

Code and Its Execution Can Be Art

- The code has a purpose
- but that purpose is divorced from material needs
- We don't expect it to compute like we might tax software or a social network
- *someone please write a gofmt that makes all Go code into donuts*

source: https://github.com/Fifirex/donut.c

Code and Its Execution Can Be Art

```
@i=split //,pop(@ARGV);print@i,"\n"and$i[rand int $#i]=chr((int rand 94)+32)while($ARGV[0]--);
```

```
I am sitting in a room different from the one you are in now. I am printing plain text and I am going to recur this operation until the text is destroyed.
I am sitting in a roo( different from the one you are in now. I am printing plain text and I am going to recur this operation until the text is destroyed.
I am sitting in a roo( different from the one you are in now. I am printing clain text and I am going to recur this operation until the text is destroyed.
I am sitting in a roo( different from the one you are in now. I am printing clain text and I am going to recur this operation +ntil the text is destroyed.
I am sitting in a roo( differe&t from the one you are in now. I am printing clain text and I am going to recur this operation +ntil the text is destroyed.
I am sitting in a roo( differe&t from the one you are in now. ' am printing clain text and I am going to recur this operation +ntil the text is destroyed.
I am sitting in a roo( differe&t from the one you are in now. ' am printing clain text and IBam going to recur this operation +ntil the text is destroyed.
I am sitting in a roo( differe&t from the one you are in now. ' am printingHclain text and IBam going to recur this operation +ntil the text is destroyed.
I am sitting in a roo( diff!re&t from the one you are in now. ' am printingHclain text and IBam going to recur this operation +ntil the text is destroyed.
I am sitting in a roo( diff!re&t from theUone you are in now. ' am printingHclain text and IBam going to recur this operation +ntil the text is destroyed.
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I am sitting in a roo( diff!re&t from theUone you are in *ow. ' am printingHclain text and IBam going to recur this operation +ntil the text is destroyed.
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```

The Broken Paintbrush

A programming language is a tool used to produce creative works just like a paintbrush

- A dilettante's drunk walk
- A trail of broken paintbrushes

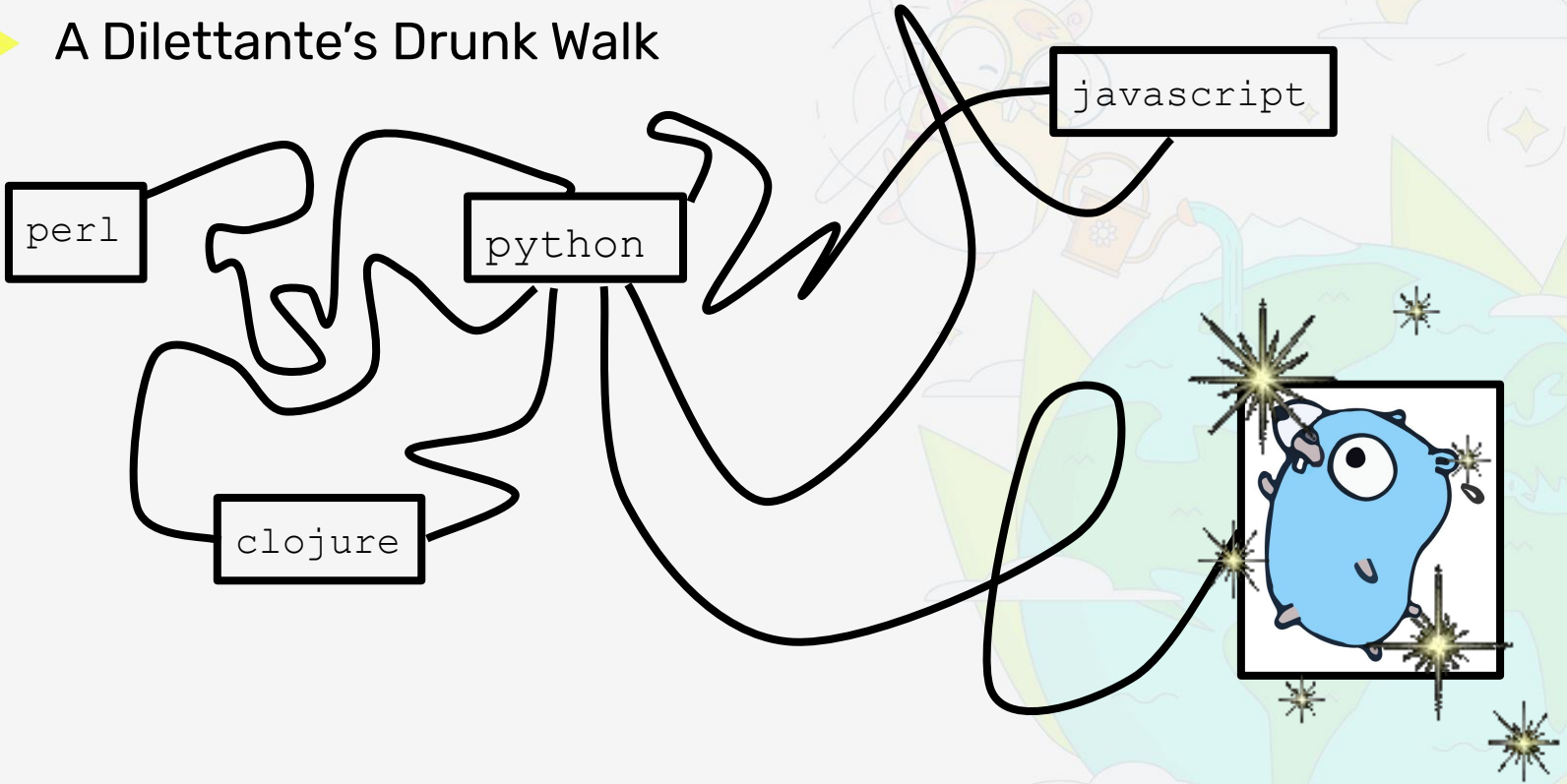
A Trail Of Broken Paintbrushes

A Trail Of Broken Paintbrushes

A Trail Of Broken Paintbrushes

A Trail Of Broken Paintbrushes

A Dilettante's Drunk Walk



A Trail Of Broken Paintbrushes

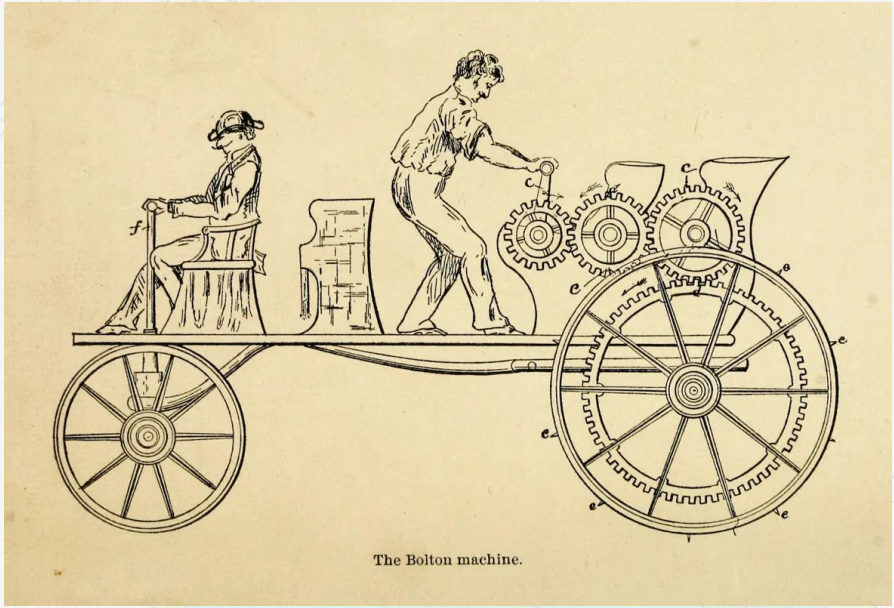
perl (2000s)

- inherently unmaintainable beyond a certain size
- something about not being formally parse-able always freaked me out
  - https://perlmonks.org/?node_id=663393

A Trail Of Broken Paintbrushes

javascript (early 2010s)

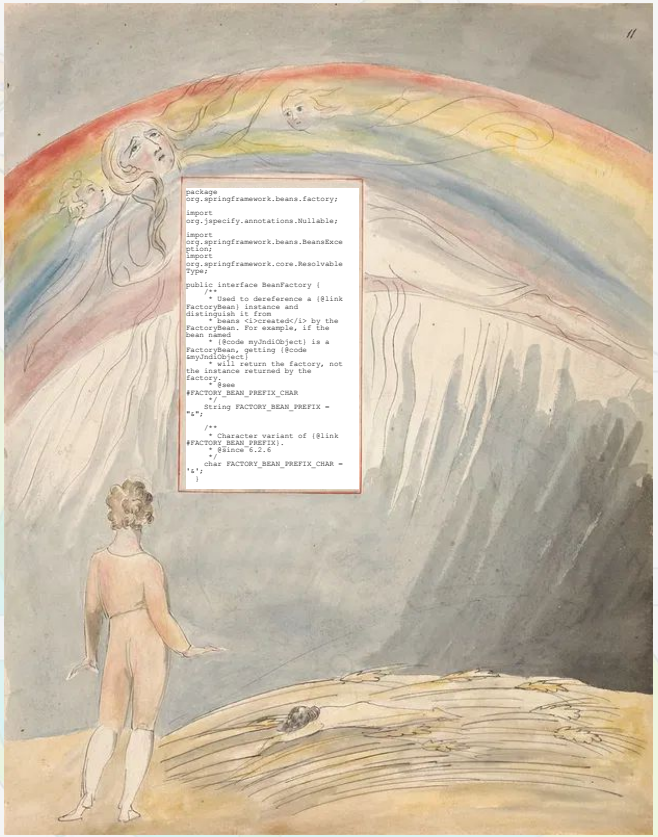
- astonishingly incomplete standard library
- ecosystem of bandaids and bandaids for the bandaids
- hard to remember edge cases and gotchas



A Trail Of Broken Paintbrushes

clojure (late 2010s)

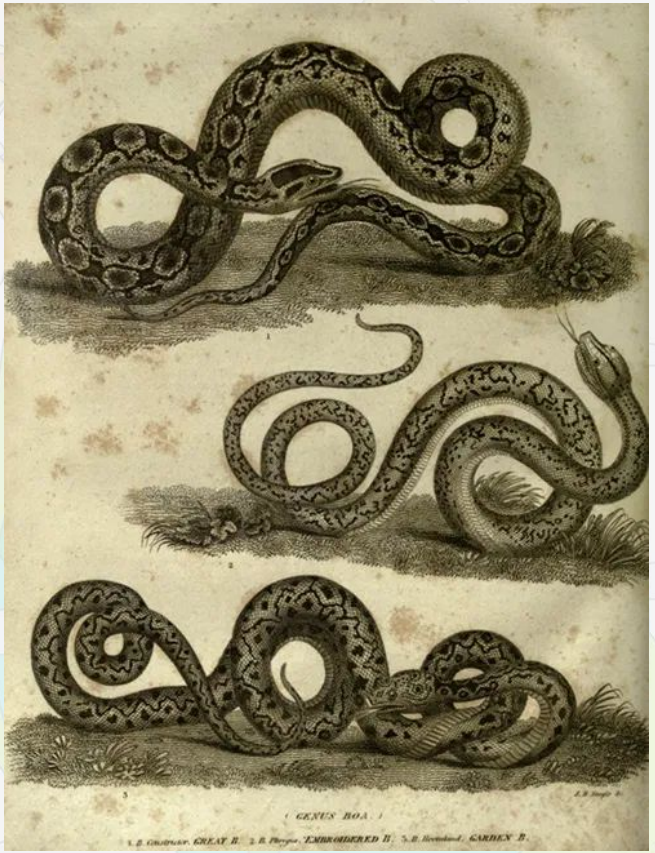
- really cool language, but…
- I find working with the JVM like programming via bureaucratic paperwork



A Trail Of Broken Paintbrushes

python (throughout 21st century)

- much love and affection
- but kept having to work around performance limits
- projects kept getting stuck in packaging purgatory



A Trail Of Broken Paintbrushes

A Trail Of Broken Paintbrushes

"ideas are like fish. If you want to catch little fish, you can stay in the shallow water. But if you want to catch the big fish, you've got to go deeper"

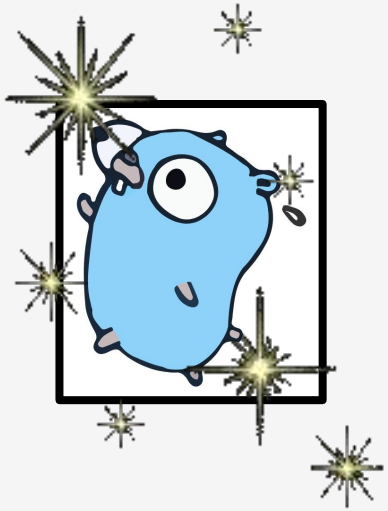
-David Lynch on transcendental meditation + art

this is kind of like "flow state" but for feelings not logic

A Trail Of Broken Paintbrushes

constantly fretting over tools means less time in a creative mindset

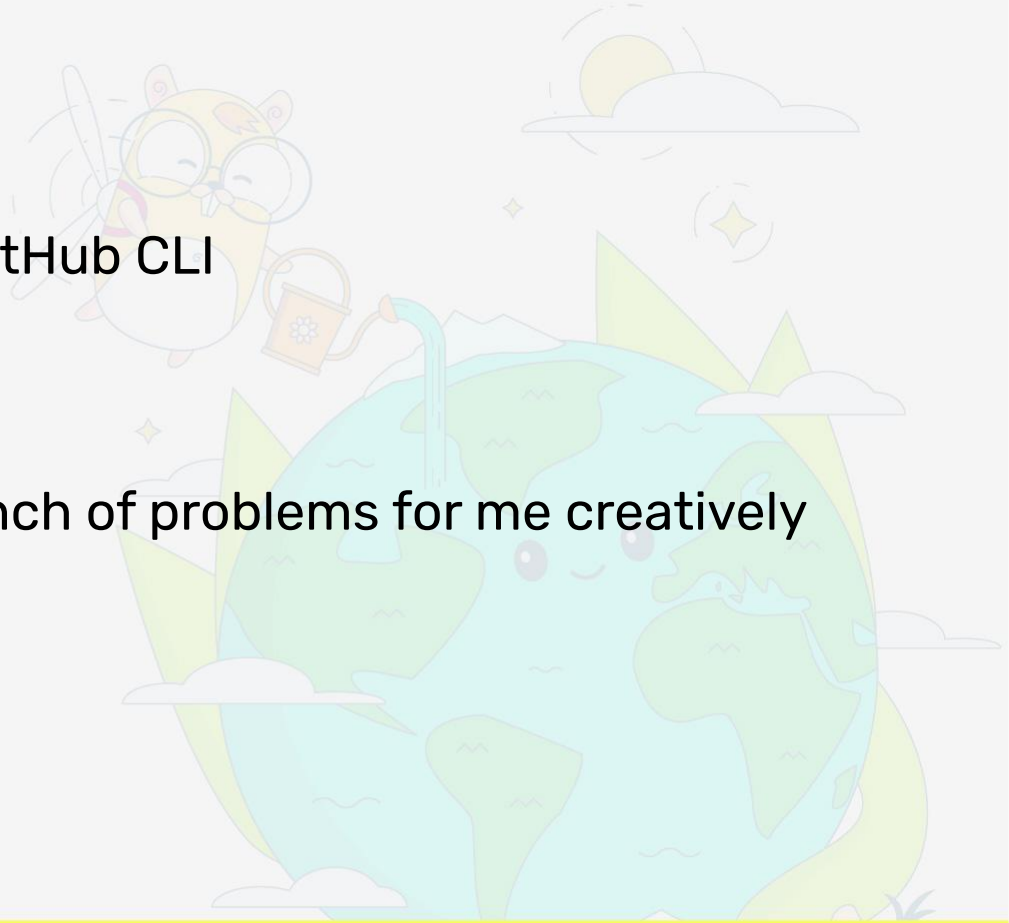
Art+Go



- Getting to Go
- Wow, it’s fast
- Constraints are good
- Prototyping & Feedback loops
- Memory Safety
- The Surgical Paintbrush

Getting to Go

- Selected it at work for the GitHub CLI
  - easy to build
  - fast
  - cross platform
- Realized it would solve a bunch of problems for me creatively



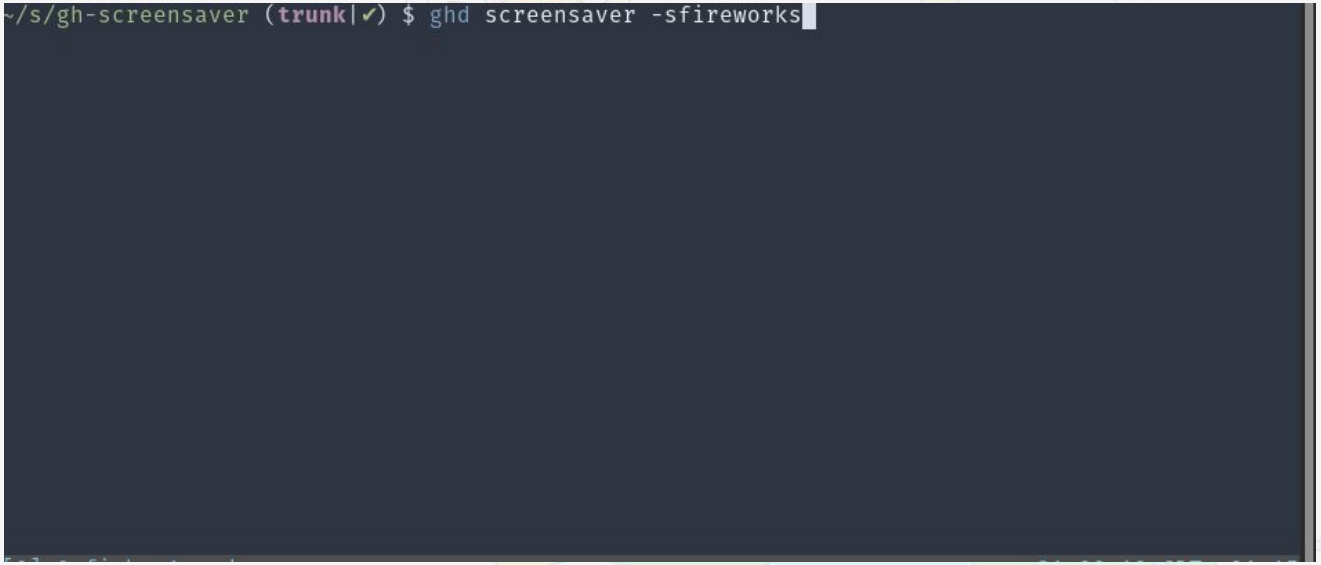
- Wow, it's fast

Without thinking too hard I could port this C implementation of an ASCII starfield to Go

https://github.com/vilmibm/gh-screensaver

- Wow, it’s fast

Naturally the next step was to write a bunch of terminal “screensavers”



https://github.com/vilmibm/gh-screensaver

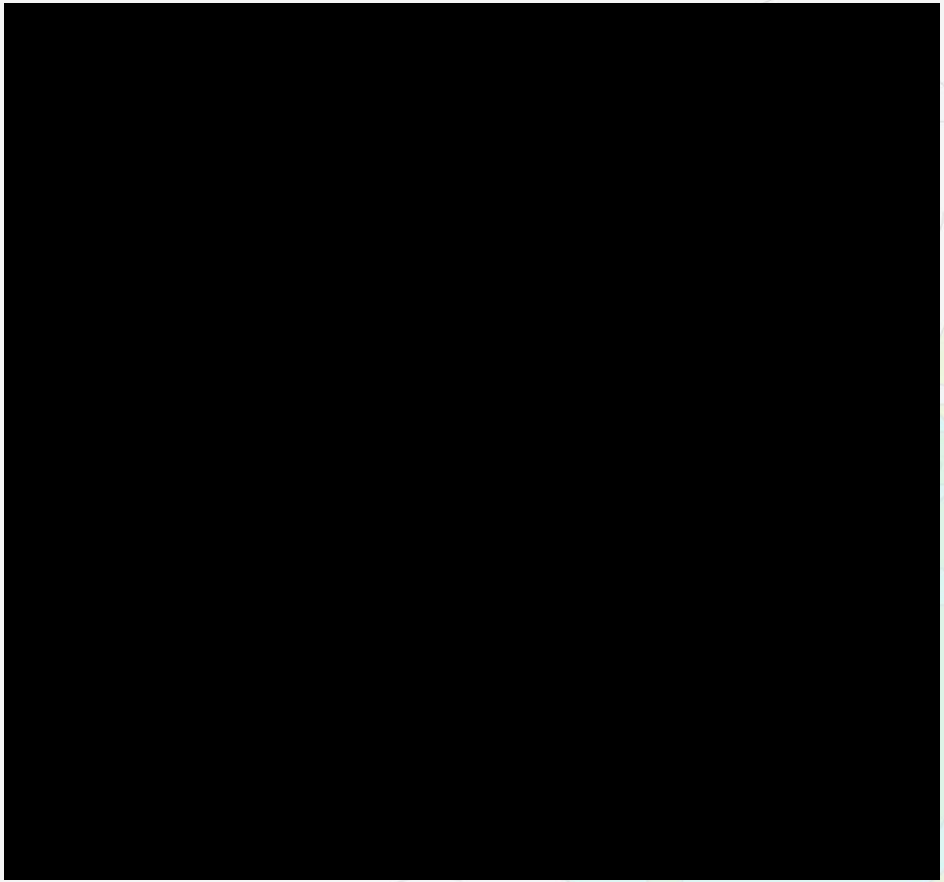
Wow, it's fast

- I went as far as to make a game abo
  open source triage
- it's not fun but it's funny (maybe)
- it's animating a ton of stuff while als
  responding to user input
- and feels pretty good!

https://github.com/vilmibm/gh-mergeconflict

Wow, it's fast

I could even burn text



https://github.com/vilmibm/smudge

Wow, it's fast

In the course of these projects I wrote a simple Unity-inspired framework using **gdamore/tcell**

```
type Game struct {...}

func (g *Game) DrawStr(x, y int, str string,
                       style *tcell.Style) {...}

func (g *Game) AddDrawable(d Drawable) {...}
func (g *Game) Destroy(d Drawable) {...}
func (g *Game) Update() {...}
func (g *Game) Draw() {...}

func (g *Game) FindGameObject(
  fn func(Drawable) bool) Drawable {...}

func (g *Game) FilterGameObjects(fn func(Drawable)
bool) []Drawable { }
```

Wow, it's fast

I think the fact that I could write this with success as someone without much relevant background is a testament to Go's great design choices

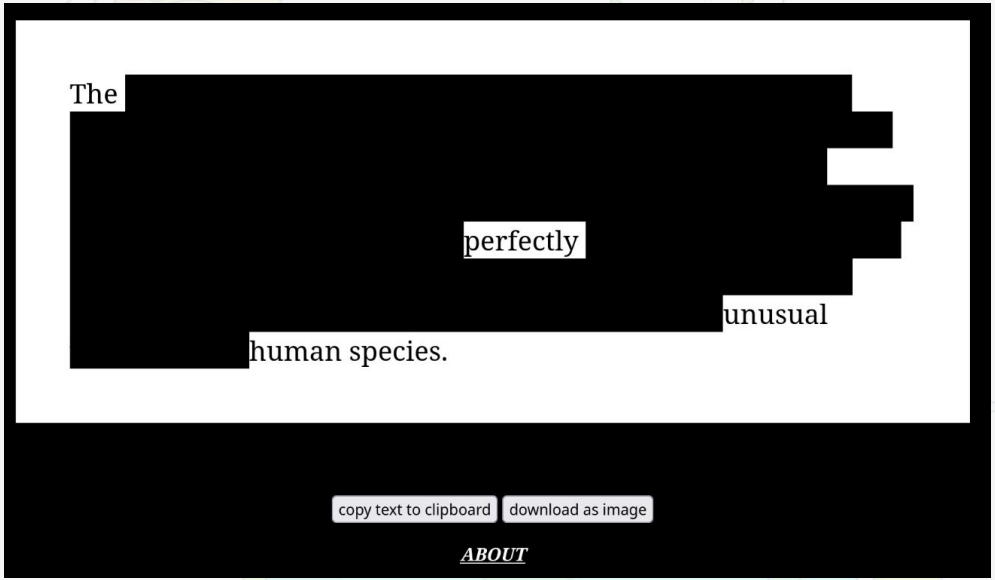
```
type smoke struct {
    game.GameObject
    HP int
}

func (s *smoke) Update() {
    if s.HP == 0 || s.Y < 0 {
        s.Game.Destroy(s)
        return
    }
    spriteSheet := "....++++####"
    s.Sprite = string(spriteSheet[s.HP-1])
    color := int32(rand.Intn(120) + 60)
    so :=
s.Game.Style.Foreground(tcell.NewRGBColor(color,
color, color))
    s.StyleOverride = &so
    s.HP--
    s.Y--
    s.X += rand.Intn(3) - 1
}
```

Wow, it's fast

- I could suddenly work with text at a massive scale
- Sliced the entire Project Gutenberg corpus into 10 million paragraphs

blackout.tilde.town

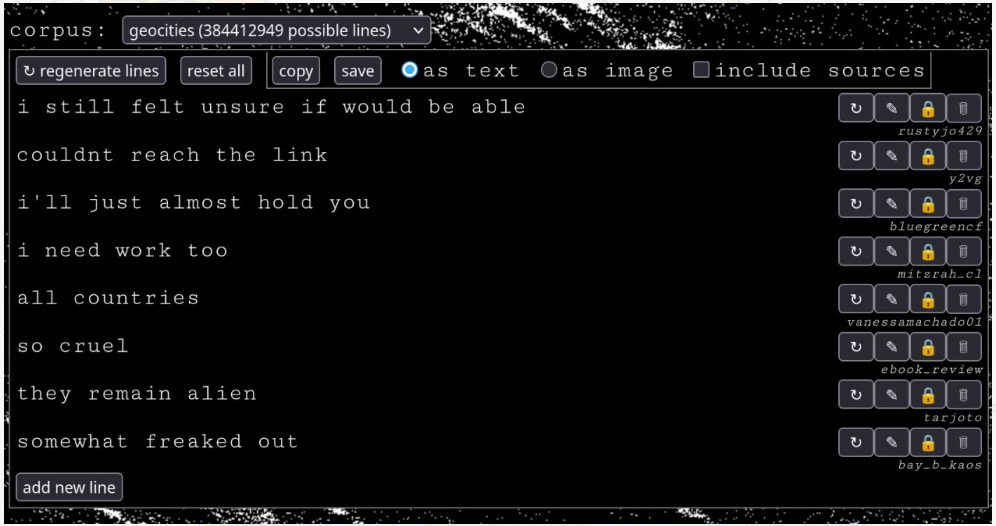


https://github.com/vilmibm/gutchunk
https://github.com/vilmibm/blackout

Wow, it's fast

- Cut-up poetry tool with arbitrarily large corpora
- Over 1 billion phrases cut from Project Gutenberg, Geocities, GameFAQs, and more

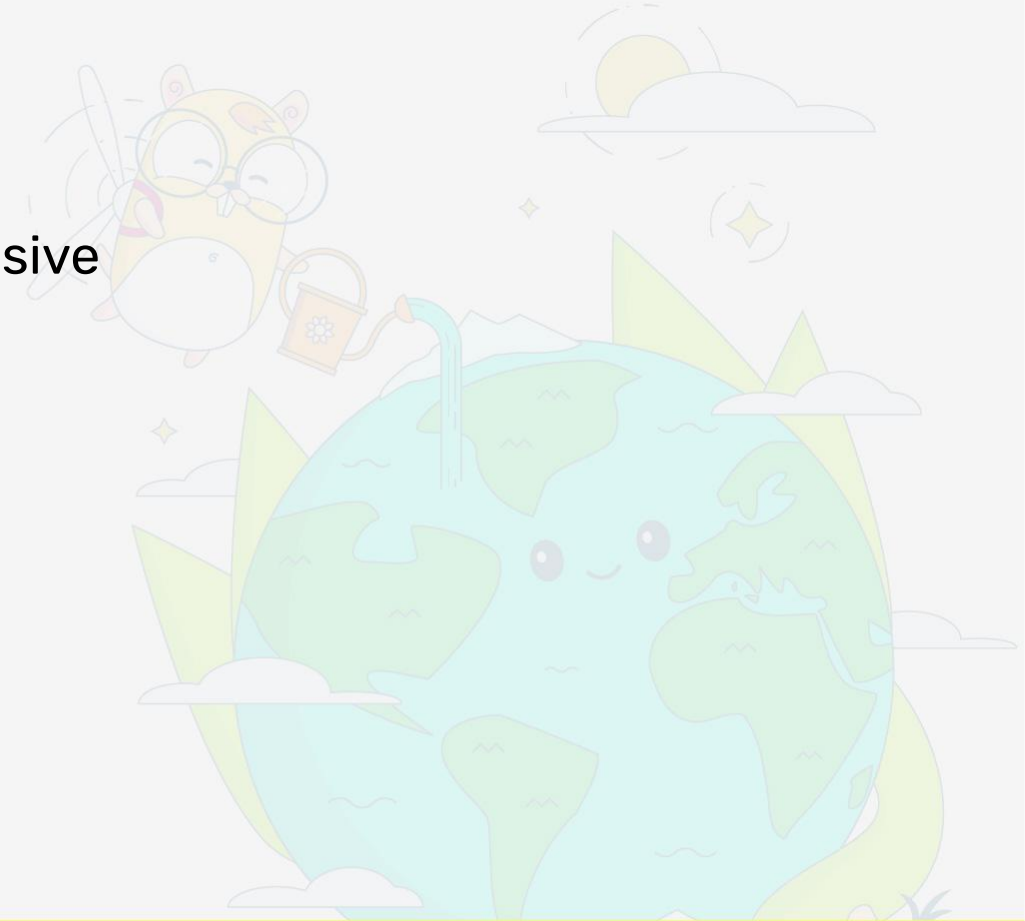
trunkless.tilde.town



https://github.com/vilmibm/trunkless

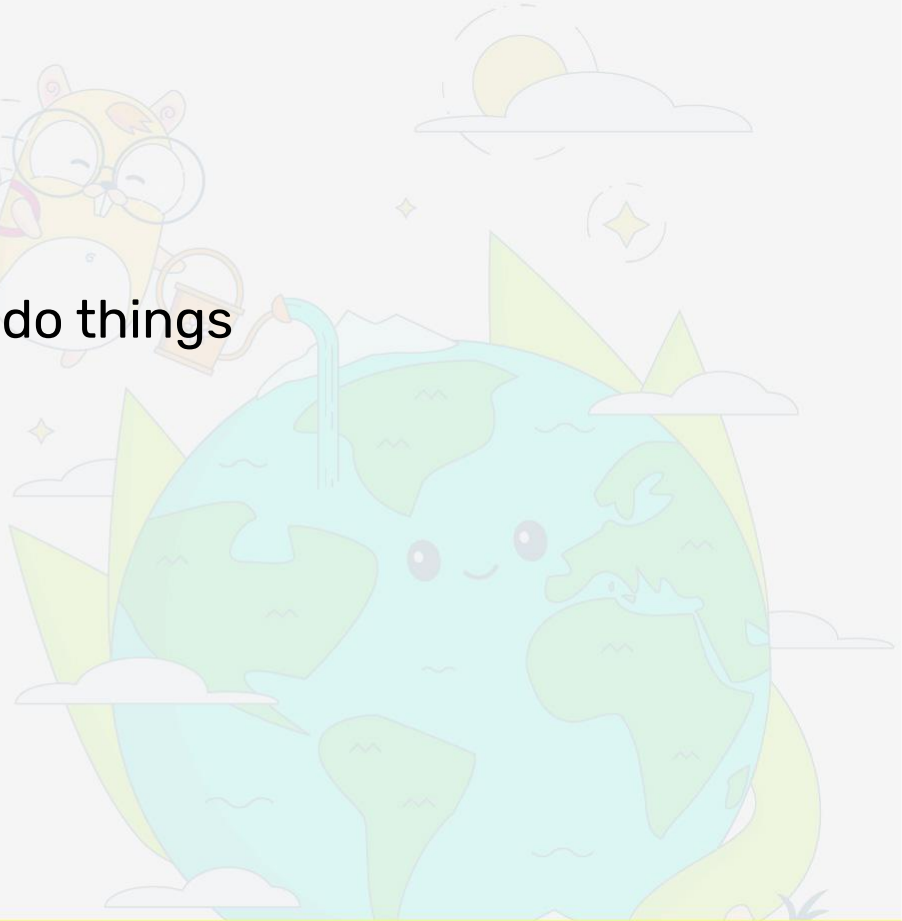
Constraints are good

- Go is simply not that expressive



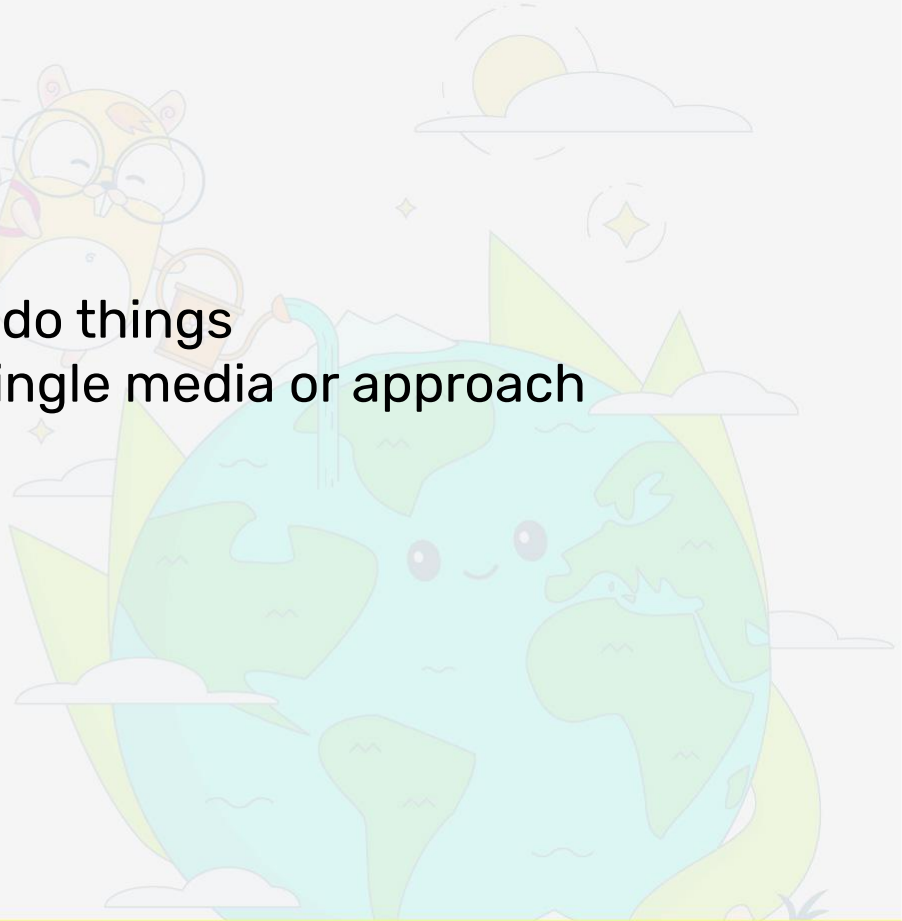
Constraints are good

- Go is simply not that expressive
- There’s generally a single way to do things



Constraints are good

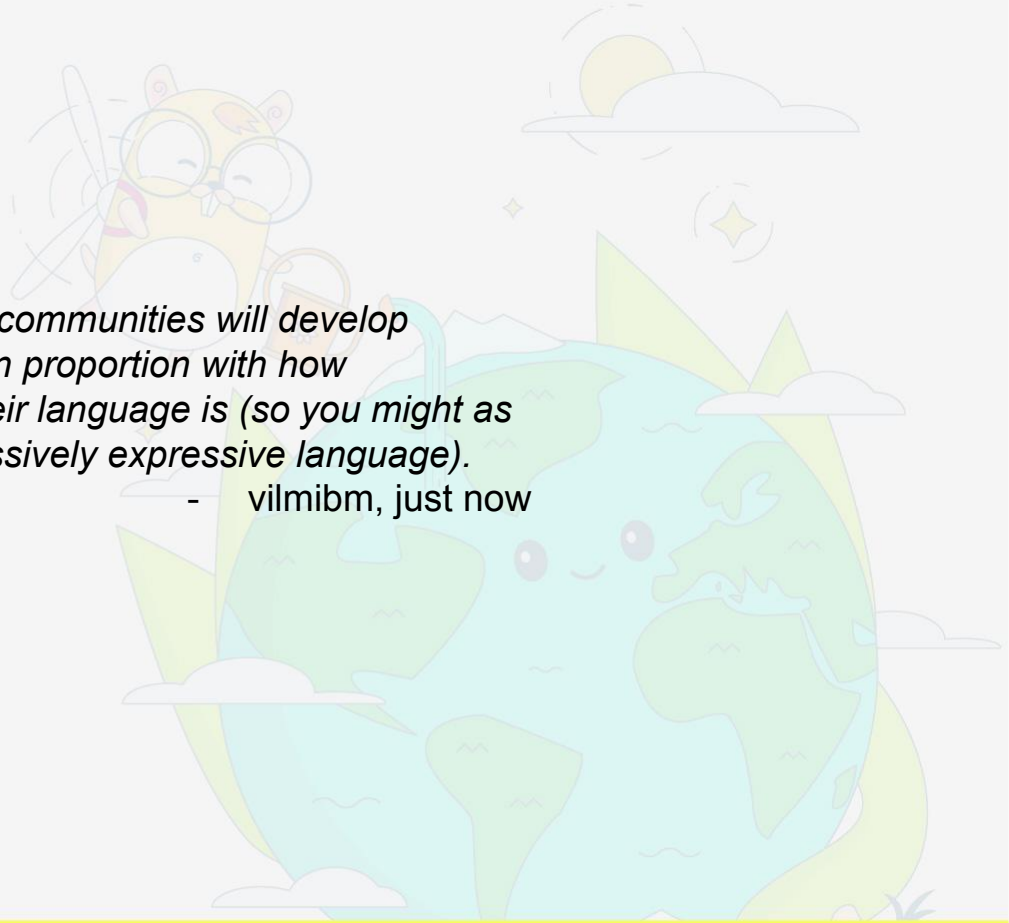
- Go is simply not that expressive
- There’s generally a single way to do things
- It’s like restricting yourself to a single media or approach



Constraints are good

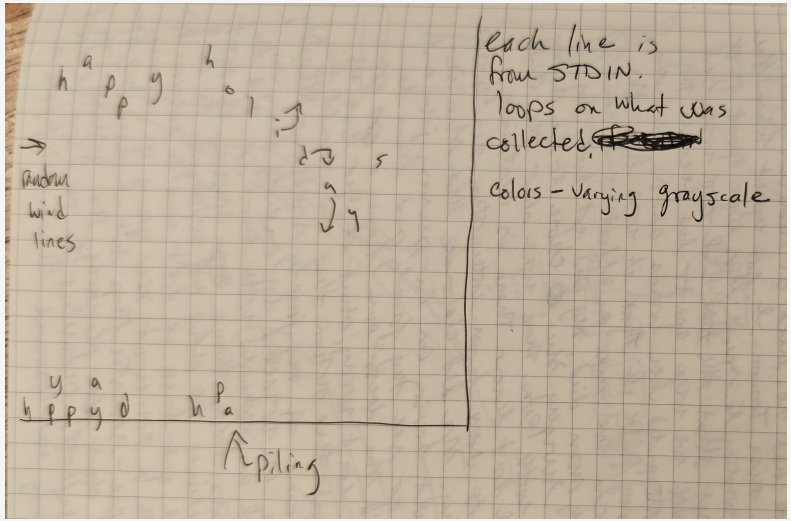
Law of Use Strict
All programming language communities will develop draconic rules about style in proportion with how permissively expressive their language is (so you might as well start with a less permissively expressive language).

- vilmibm, just now



Prototyping & Feedback

I often start projects from a rough sketch and iterate quickly, playing with my code



https://github.com/vilmibm/drift

Prototyping & Feedback

I like to progressively add error handling as I iterate. To start, I'll often ignore them (unless they are critical to the line I'm currently thinking about).

```
// first, ignore
foo, _ := doStuff()
bar, _ := doMoreStuff(foo)
baz, _ := doEvenMoreStuff(bar)

quux, err := importantThing(baz)
if err != nil {
  panic(err)
}
```

Prototyping & Feedback

On a second pass I'll just panic for everything; this creates a natural "TODO" list for error handling.

```
// then, panic
foo, err := doStuff()
if err != nil {
  panic(err)
}

// …
```

Prototyping & Feedback

Finally, I convert the panics to Errorf calls once the codebase has settled.

```
// finally, handle
foo, err := doStuff()
if err != nil {
  return fmt.Errorf(
    “tried to do stuff but: %w”,
    err)
}
```

Prototyping & Feedback

- Scared of going without a REPL
- Luckily super fast builds make print debugging tolerable
- I use this vim abbreviation all the time
- “%#v” instead of “%v” will show struct field names

```
iab dbg fmt.Printf("DBG %#v\n",

'dbg foo)' becomes:

fmt.Printf(“DBG %#v\n”, foo)
```

Prototyping & Feedback

```
import fmt

type book struct {
  Title string
  Author string
}

b := book{"tender buttons", "gertrude stein"}

fmt.Printf("%v", b)  // {"tender buttons" "gertrude stein"}
fmt.Printf("%#v", b) // main.book{Title: "tender buttons", Author: "gertrude stein"}
```

Prototyping & Feedback

"yaegi" REPL

- quite fast
- not many quality of life features
- more reliable than other REPL I tried

```
go install github.com/traefik/yaegi
```

```
$ rlwrap yaegi
> type Cat struct {
    Name string
    Color string
}
: 0x14000462690
> c := Cat{"Unix", "tortoiseshell"}
: {Unix tortoiseshell}
> import "fmt"
: 0x14000462d10
> fmt.Println(c)
{Unix tortoiseshell}
: 21
>
```

Memory Safety

- I put a lot of faith in the general memory safety of Go programs
  - even without the obsessive machinery of a language like Rust
- I trust the compiler, the test tooling, and the language itself
- This has led me to do more ambitious stuff with SSH-based applications
- shout out to **charmbracelet/wish**

Safety

- led to the creation of the current sign-up application for the tilde town community
- instead of a google form, web application, or other bureaucratically shaped interaction it's a little text adventure
- the transcript of an applicant's session is their application
- partially inspired by the Voigt-Kampff test from Blade Runner

```
ssh join@tilde.town
```

```
                    the tilde town sign up portal
You open your eyes.

You're in some kind of workshop.
Wires and computers in various state of disrepair are strewn across
tables and shelves. It smells faintly of burnt cedar.

The wires and components before you slowly drag
themselves into the shape of a small humanoid.

wire guy says:
    hello, welcome to the application for membership in tilde town.
    first, please let me know what a good email address is for you?

    just say it out loud. as many times as you need. to get it right.

    once you've told me your email you can /nod to move on.


                          press enter to send
type /help and press enter to get help. type /quit and press enter to leave.
```

The Surgical Paintbrush

- not only does this paintbrush not break, it feels indestructible

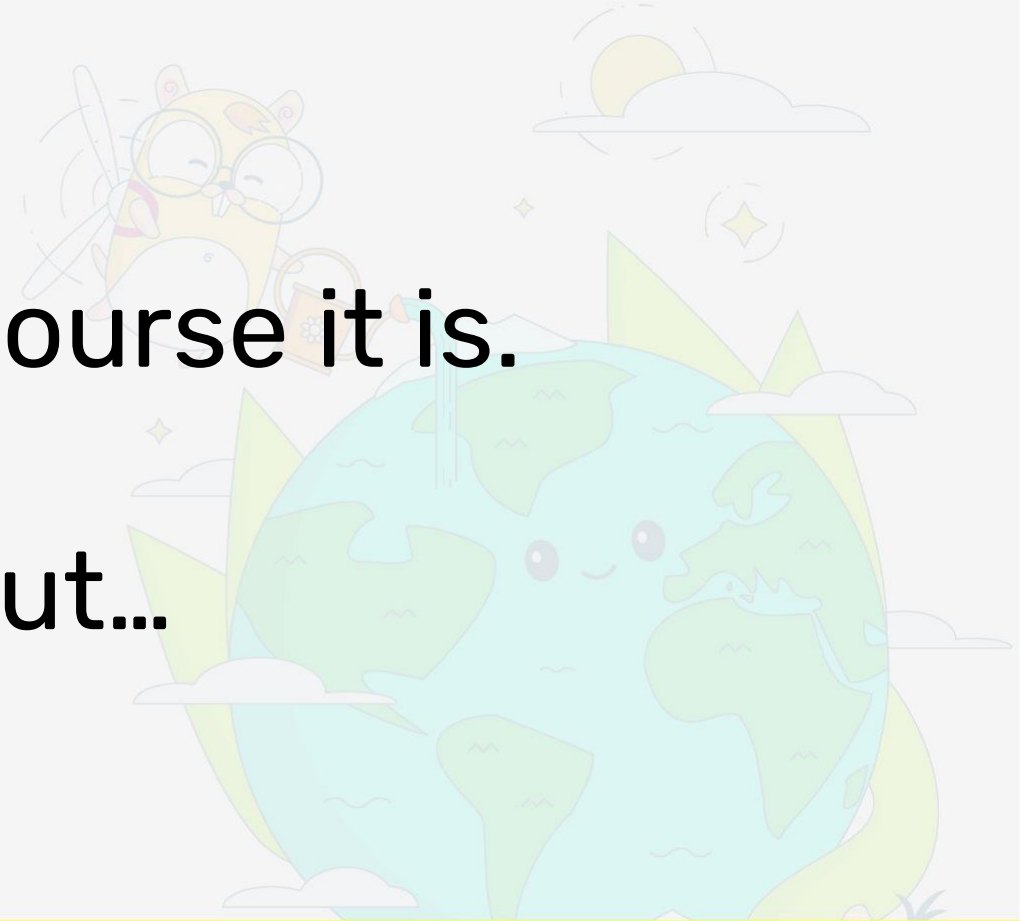
The Surgical Paintbrush

- not only does this paintbrush not break, it feels indestructible
- like some kind of titanium, medical grade paintbrush

The Surgical Paintbrush

- not only does this paintbrush not break, it feels indestructible
- like some kind of titanium, medical grade paintbrush
- that’s good, right?

The Surgical Paintbrush



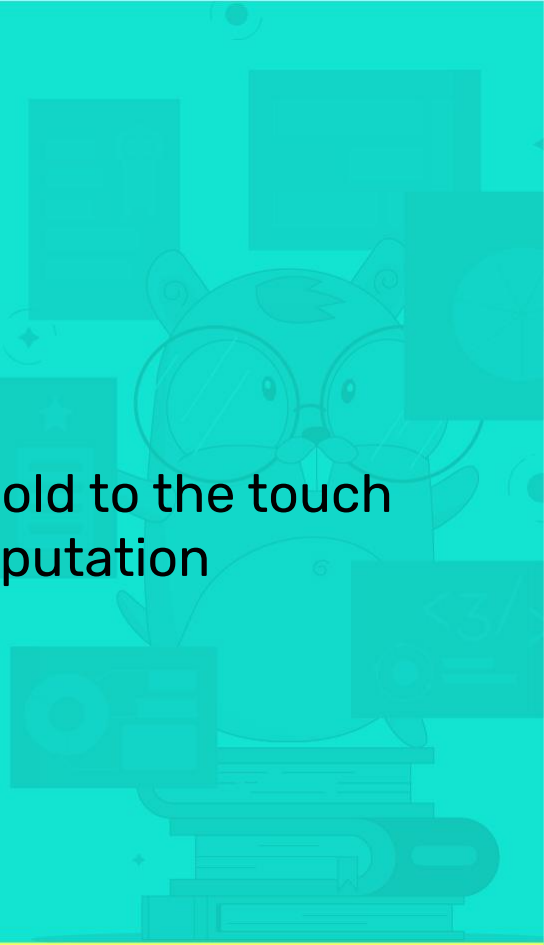
yes! of course it is.

but...

A Curious Lack

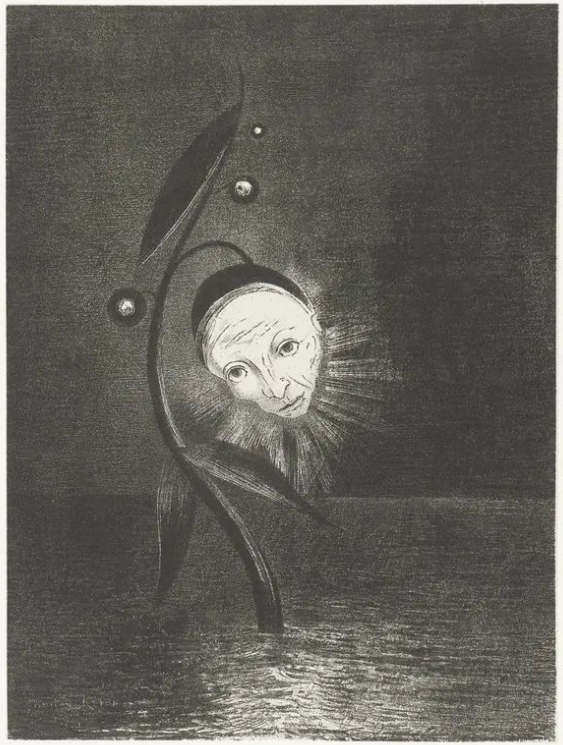
Something has felt missing and it's hard to articulate

- A surgical tool is cold to the touch
- An unfortunate reputation
- A rallying cry



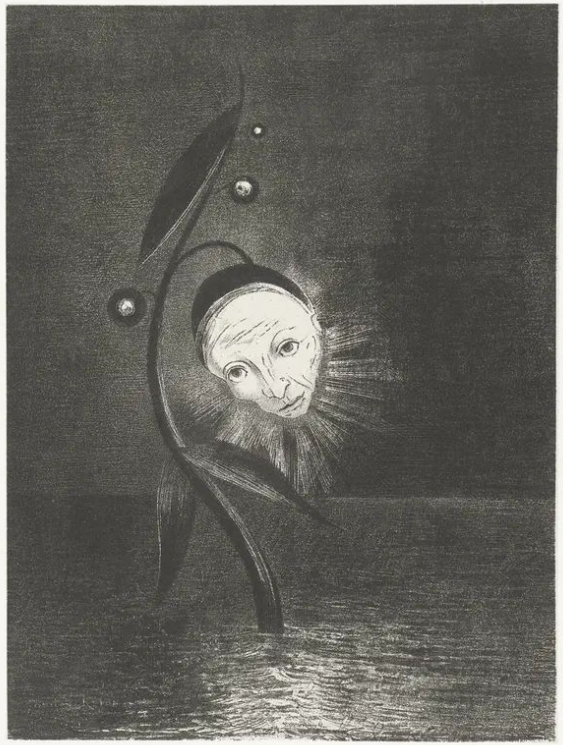
A Surgical Tool is Cold to the Touch

- there’s a fine line between jank and whimsy



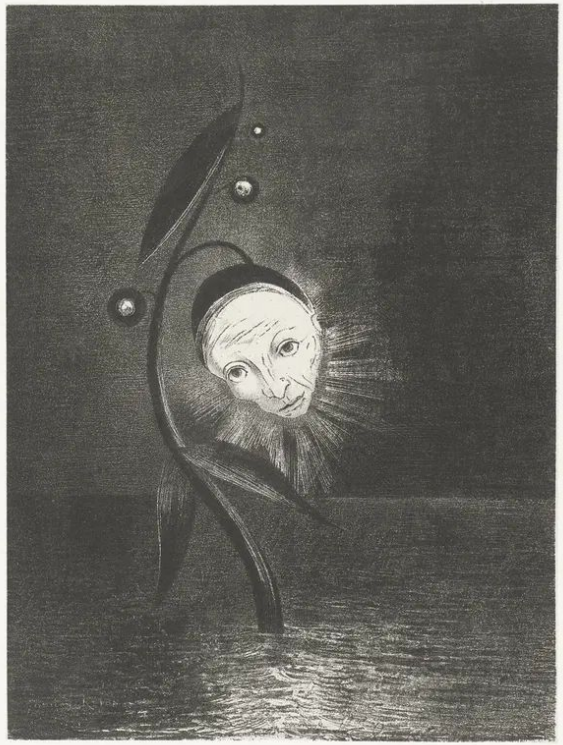
A Surgical Tool is Cold to the Touch

- there’s a fine line between jank and whimsy
- something has felt missing



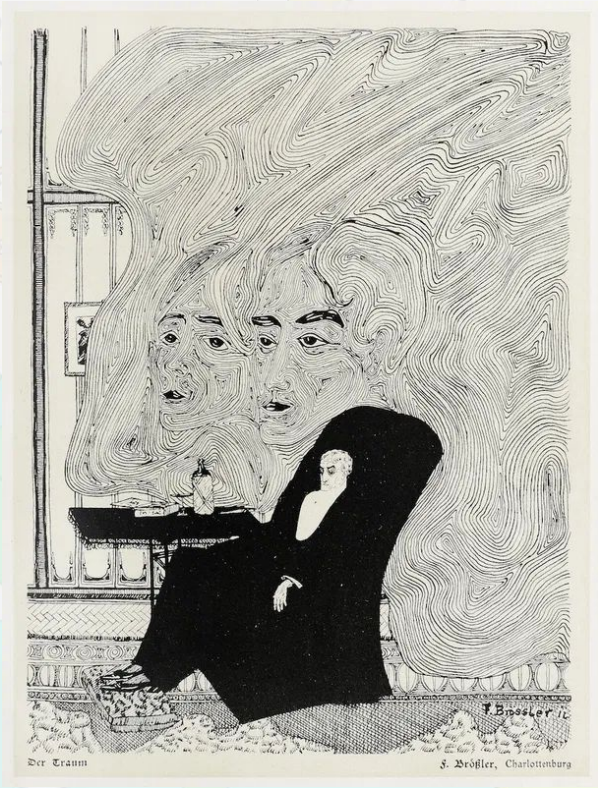
A Surgical Tool is Cold to the Touch

- there's a fine line between jank and whimsy
- something has felt missing
- but maybe it's not the technology?



An Unfortunate Reputation

- In the circles I keep…



An Unfortunate Reputation

- In the circles I keep…
  - “corporate product”
  - “ew, error handling”
  - “it’s just algol-68”
  - “it’s just google java, right?”

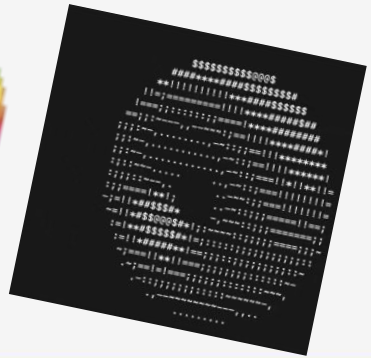
An Unfortunate Reputation

- I mention not as something Go needs to fix as a tool or community…

An Unfortunate Reputation

- I mention not as something Go needs to fix as a tool or community…
- but in case others have experienced this, too

A Rallying Cry



weird

A Rallying Cry

some inspirations…

- Surrealist Rails App Workshop *
  - http://pineconedoesthings.com/surreal.html
- Stupid Shit No One Needs & Terrible Ideas Hackathon
  - https://stupidhackathon.com/
- the Oblique Strategies
  - https://www.oblique-strategies.com/
- Ted Nelson's Computer Lib/Dream Machines
  - https://archive.org/details/computer-lib-dream-machines
- The awesome talks of GoLab 2025

** full disclosure i have since married the person who ran this*

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https://gifcities.org